
Division 15

DIVISION 15 - MECHANICAL**SECTION 15100 – GENERAL REQUIREMENTS**

- A. Objectives
 - 1. The objective is to achieve a complete year-round heating and air conditioning system for all indoor areas occupied by people or equipment, with separate zones for different activities. Housing areas may be designed to be naturally ventilated under normal warm weather operating conditions.
- B. Requirements
 - 1. Provide engineering design, materials, equipment and labor necessary for a complete, good quality, and properly functioning mechanical installation.
 - 2. System design and installation shall allow for easy equipment access for replacement and maintenance, efficient operation at all times (night and day, all seasons), low mechanical owning and operating costs, flexibility, adaptability, and long, reliable equipment life.
 - 3. Provide exhaust ventilation where needed. Use tamper-proof air inlets and outlets for cells and holding rooms. Control room air handling units, ductwork, and air devices are to be separate from other systems.
- C. All HVAC systems and equipment and other mechanical systems and equipment shall be programmed, designed, constructed, tested, demonstrated, and completed in accordance with applicable provisions of the following:
 - 1. International Mechanical Code, 2003 Edition
 - 2. Uniform Plumbing Code, 2003 Edition
 - 3. International Energy Conservation Code, 2003 Edition
 - 4. International Fuel Gas Code, 2003 Edition
 - 5. American Society of Engineers, Boiler and Pressure Vessel Code, 2001 Edition
 - 6. ASME A17.1, 2000 Edition, Appendix N, Table N1, Recommended Inspection and Test Interval in Months
 - 7. ASHRAE Guideline 1-1996, HVAC Commissioning Process. This starts at the beginning of the Design-Build program and design, and continues through and past acceptance of the project.
- D. Systems shall be easy to operate, control, maintain, fault-find, and repair. Ease of maintenance shall be designed into all aspects of the systems to ensure their long-term reliability and serviceability. Provide training of Owner's personnel on operation and maintenance of systems and equipment.
- E. All equipment shall be designed and located to minimize noise and vibration transmission to occupied spaces. Thermostats shall be located and protected to prevent vandalism and damage/destruction by delivery carts or equipment.
- F. A life cycle cost analysis shall be performed by the Design-Builder to determine the most advantageous and cost effective means of providing HVAC to the facility. The study should include maintenance, operating and salvage costs as well as installation.
- F. The requirements for fire protection, smoke control and smoke evacuation shall be studied, reported on, and implemented to achieve acceptable building and occupant safety.
- G. Redundancy, back-up and distributed systems are encouraged so that the failure of an item of equipment has a limited effect on the facility as a whole. All essential mechanical services shall operate under conditions of power failure. The facility must be able to operate (with

reduced services) for several days under emergency conditions. Domestic hot water, essential pumps, essential ventilation, and life/safety functions are some of the systems which must operate. Refer to Division 16 – Electrical and Mechanical sections, for additional details of equipment to operate on emergency power.

- H. The mechanical system shall be capable of serving the complete facility and projected future expansion (see Pre-Architectural Program for possible location and general size of future expansion). Points for future expansion shall allow for connection without disruption to the operation of the initial facility, and without requiring work to be carried out inside any secure areas. The facility systems shall operate efficiently.
- I. Outside design conditions for cooling shall be a minimum of 87°F dry bulb and a minimum of 75°F wet bulb; and inside 75°F dry bulb and 50% relative humidity. For heating, outside design conditions shall be 46°F dry bulb and inside conditions shall be 70°F. In all weather and at all loads and occupancy, inside conditions shall conform to ASHRAE Standard 55-1992 and 55A-1995. Space relative humidity shall not exceed 60% at all climatic conditions and under all load conditions.
- J. Energy Management and Control System
 - 1. Provide a complete and operating control system, with pneumatic operators, and completely integrated direct digital control (DDC). The system includes, but is not limited to, a personal computer interface, software, printer, modem, application specific controllers, general purpose programmable controllers, wiring and control devices including temperature sensors, valves and relays. Failure of any single component in the system shall not adversely affect other system functions.
 - 2. Each controller shall maintain individual temperature setpoints for occupied, unoccupied and night setback/setup modes of operation. Each controller shall maintain time of day schedule(s) and an internal clock. Loss of power shall not affect any setpoints, schedules, collected data or operating parameters set into the controller. System communications shall allow any system controller to share data with any other system controller without intervention by a central computer.
- K. Specific Functional Component Requirements
 - 1. Medical Services: All plumbing, heating, ventilation, and air conditioning shall be in compliance with applicable local, state and other standards and requirements.
 - 2. Food Service Areas:
 - a. Provide a filtered outdoor air supply fan and stainless steel hood exhaust ventilating ducts.
 - b. Provide sprinklers in cooking exhaust hoods and ducts.
 - c. Provide ventilation as required for commercial refrigeration facilities including ice makers, coolers, freezers, and waste storage.
 - d. Provide a gas supply as required by the cooking equipment.
 - 3. Laundry Areas
 - a. Provide adequate filtered makeup air, air pressure control of areas, exhaust, and effective easily-maintained lint traps on the exhausts.
 - b. Provide steam generator for laundry ironers, and associated piping.
 - 4. Inmate Housing
 - a. Use tamper-proof air inlets and outlets for inmate areas.
 - b. Provide complete, automatic smoke management systems. Maintenance for all heating, ventilating, air conditioning, and plumbing equipment shall be from areas not accessible to inmates.
 - c. Air conditioning for cells shall operate under emergency power conditions.
 - 5. High Custody/Segregation Housing

END OF SECTION 15100

SECTION 15300 – PLUMBING**A. Functional Objectives**

1. The plumbing system shall provide domestic water and sewer service to meet both current and projected needs for potable water, sewer and fire protection systems including overcrowding and peak capacities of the housing units. The design shall make the most efficient use of available water and energy supplies.

B. Design Direction

1. All work shall be done in accordance with all applicable codes, standards and guidelines including but not limited to the National Standard Plumbing Code and NFPA. Fixture count and location guidelines as well as supply temperature guidelines shall be taken from the American Corrections Association Standards for Adult Local Detention Facilities 4th Edition unless code requirements are more stringent or otherwise indicated by the Owner or required by local code authority.
2. Ease of maintenance shall be designed into all aspects of the systems to ensure their long-term reliability and serviceability by the staff. Security of any service corridors is of critical concern and shall be considered in the design.
3. A life cycle cost analysis shall be performed by the Design-Builder to determine the most advantageous and cost effective means of supplying domestic hot water to the project.
4. In the laundry areas, provide waste hot water reclaim.

C. Sanitary Drainage

1. Dayrooms, exercise areas, and walkways shall be provided with floor drains. Floor drains and clean-outs shall be provided with secured tamper-proof screws. Provide connection to the existing Correction Center sanitary sewer system. *Note: See General Requirements for additional information pertaining to sanitary drainage.*

D. Storm Drainage (Flat roof design)

1. Roof drains shall be cast iron with vandal-proof dome.

E. Plumbing Fixtures

1. Provide domestic cold and hot water, waste and vent systems. Provide stainless steel combination lavatory/water closet or porcelain fixtures in cells and holding rooms as scheduled in the Pre-Architectural Program. Use commercial type fixtures for showers, lavatories, sinks, water closets, urinals, and service sinks in staff areas.
2. Other fixtures shall be made of heavy duty materials such as precast stone or terrazzo, high impact fiberglass or chrome-plated cast brass.
3. Penal fixtures shall have concealed mounting hardware and plumbing components, and tamperproof, easy to operate fixture controls that withstand heavy use or malicious abuse.
4. One toilet compartment/fixtures for disability access shall be provided in each toilet room.

F. Water Meter

1. Water meter shall conform to the requirements of the utility supplying the service. Sized to deliver demand. Maximum pressure drop 5 psi.

G. Backflow Preventer

1. Epoxy coated cast iron body components consisting of two check valves and a spring-loaded, diaphragm actuated, differential pressure relief valve located between the check valves; size, capacity and rating is required by design parameters and according to the plumbing code.

H. Fire Sprinkler System

1. Provide an automatic fire sprinkler system throughout the facility. Use institutional sprinklers in cells and holding rooms.

2. Provide a fire pump if one is required to meet pressure or other requirements of the fire sprinkler system.
 3. Provide control of domestic water piping from the officer stations
- I. Provide a complete storm drainage system.

END OF SECTION 15300